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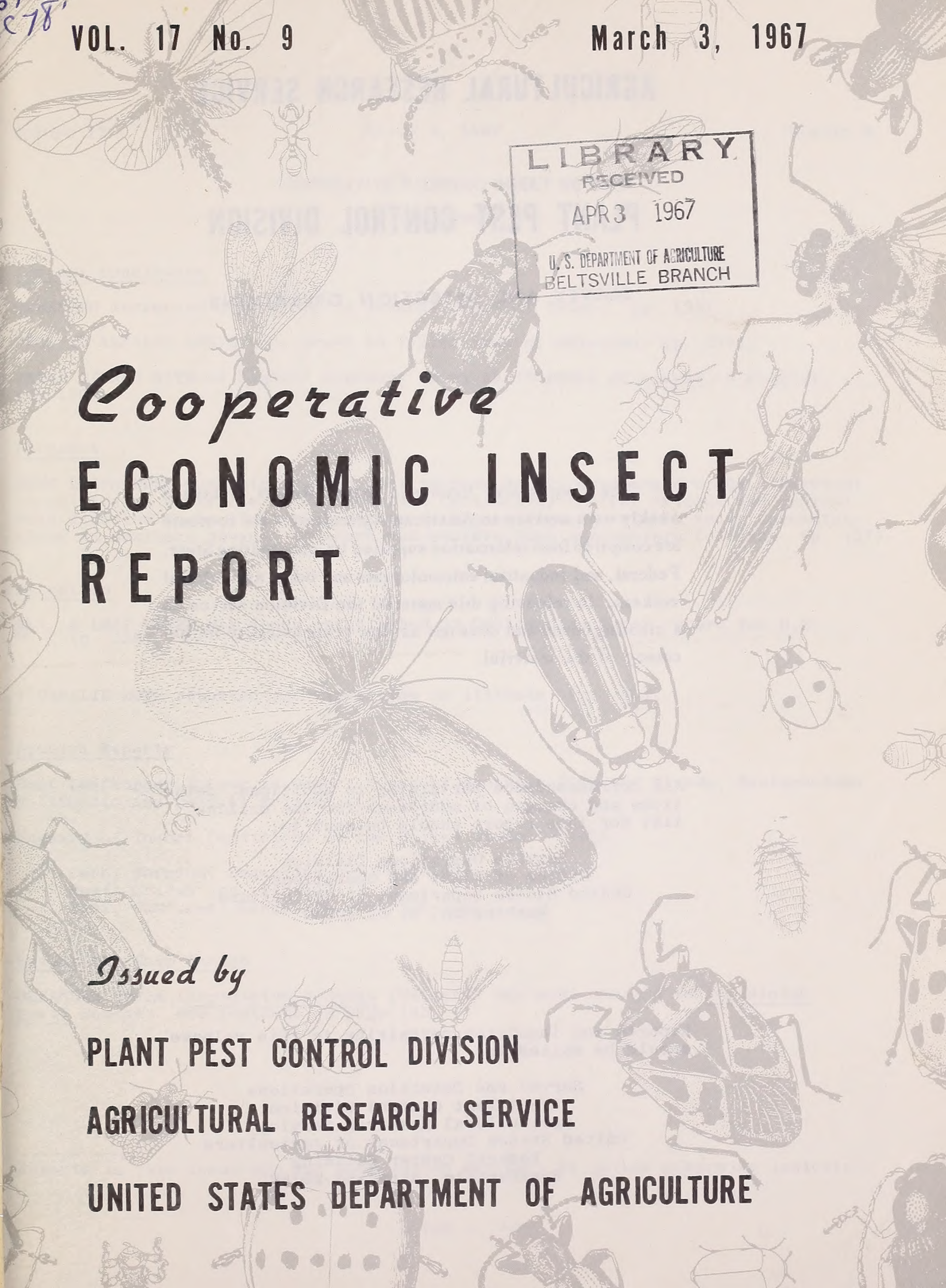

Cooperative ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Volume 17 March 3, 1967 Number 9

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

GREENBUG increased noticeably in several areas of Texas. (p. 131).

SPOTTED ALFALFA APHID very heavy in Tipton area of Oklahoma. (p. 131).

TEXAS CITRUS MITE at highest February level in 15 years on citrus in Florida. (p. 133).

Forecast

BEET LEAFHOPPER much higher than last year in desert breeding grounds. Movement to cultivated districts of southeastern California, central Arizona and central Utah expected to be light to moderate with possible moderate to heavy concentrations in southern Nevada, southern and eastern Utah and western Colorado. (p. 131).

Detection

● A LEAF MINER FLY found established in California; first record for U.S. (p 136).

A PYRALID MOTH reported for first time in Illinois. (p. 133).

Special Reports

Beet Leafhopper Survey in Desert Areas of Southern Utah and Nevada, Southeastern California and Central Arizona. (p. 131).

Summary of Insect Conditions in the United States - 1966

Corn, Sorghum, Sugarcane (pp. 137-142).
Small Grains (pp. 143-145).
Turf, Pastures, Rangeland (pp. 146-148).

Scientific Name Change

OLEANDER SCALE (*Aspidiotus hederae* (Vallot)) has been changed to *Aspidiotus nerii* Bouché. See footnote on page 133.

Reports in this issue are for week ending February 24 unless otherwise indicated.

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Summary of Insect Conditions in the United States - 1966

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WEATHER OF THE WEEK ENDING FEBRUARY 27, 1967

HIGHLIGHTS: Mild in the West but stormy, windy, and cold east of the Rockies with heavy snows north and thunderstorms in the Southeast.

PRECIPITATION: Active storm centers moving through the Great Lakes area produced blizzards in the North from the Rocky Mountains to New England while cold fronts caused heavy thunderstorms from eastern Texas to the central Appalachians. Up to 18 inches of snow fell at some locations in northern New England. Traffic was hampered or stalled throughout the heavy snow and blizzard areas. Areas from northern Mississippi to eastern Kentucky recieved more than an inch of rain.

WIND: Westerly winds exceeded 50 m.p.h. in portions of the North Central States at midweek and over the Northeast during the weekend. Strong winds and low temperatures caused much discomfort over the Northeast on Saturday and Sunday. At Ogden Dunes, Indiana, the winds reached 82 m.p.h. Gales blowing across the Great Lakes produced snow squalls on the lee shores. In some areas, wind-blown snow reduced visibility to near zero and highway traffic was at a standstill. It was also windy farther west. Strong southwesterly winds over the western edge of the Great Plains raised clouds of dust causing considerable soil erosion and damage to winter wheat.

Weather continued on page 148.

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

Beet Leafhopper Survey in Desert Areas of Southern Utah and Nevada, Southeastern California and Central Arizona

Surveys were conducted for beet leafhopper (*Circulifer tenellus*) during the period January 30 to February 14, 1967. If present conditions prevail, spring movement from the southern desert breeding grounds to cultivated districts of southeastern California, central Arizona, and central Utah is expected to be *light* to *moderate*. Movement to southern Nevada, southern and eastern Utah and western Colorado is expected to be *moderate* to *heavy*.

The southern breeding grounds, comprising approximately 50,000 square miles of potential weed host area, were considered to have an estimated 39-percent host plant cover at time of survey. Fall and early winter rains resulted in early development of annual weed hosts. These plants, however, were showing stress during the survey due to lack of later rains. Weed host plants were more general and in better condition in areas north of the 34° parallel than south.

The average number of beet leafhoppers found in areas where host plants were present was 0.09 per square foot in 1967 compared with 0.013 in 1966, 0.04 in 1965, 0.15 in 1964, 0.02 in 1963, 0.12 in 1962, and 0.02 in 1961. It is estimated from data collected during this survey that overwintering beet leafhoppers in the southern desert spring breeding grounds total 32.7 billion in 1967, compared with 6.5 billion in 1966, 12 billion in 1965, 112 billion in 1964, 7.7 billion in 1963, 6.1 billion in 1962, and 6.3 billion in 1961.

This report covers only the beet leafhopper situation in the area surveyed. It has no reference to populations that may have originated in local breeding areas in northern and eastern Utah or in western Colorado or western Nevada. (PPC, West. Reg.).

BEET LEAFHOPPER (*Circulifer tenellus*) - CALIFORNIA - Treatment was completed north of Coalinga, Fresno County, and was made in Merced, Alameda and San Joaquin Counties. Prespray counts ranged 5-30 per 10 sweeps; postspray checks indicated 98 percent kill. Approximately 11,000 acres treated. (Cal. Coop. Rpt.).

GREENBUG (*Schizaphis graminum*) - NEW MEXICO - Light to medium on wheat in Chaves County. (Mathews). TEXAS - Infestations increased noticeably in several High Plains, Rolling Plains and north central county areas last 2 weeks; however, populations generally remain noncritical. Current infestations should be watched closely as peak populations usually not reached until March or April. Prolonged cool weather usually advantageous for buildups. (Rummel, Boring, Parker). OKLAHOMA - Ranged 0-15 per linear foot on wheat in Jackson, Cotton and Washita Counties; up to 50 per linear foot in Tillman County and light to moderate in Kingfisher County. (Okla. Coop. Sur.). ARKANSAS - Remains very low in northwest area. (Ark. Ins. Sur.).

SPOTTED ALFALFA APHID (*Therioaphis maculata*) - ARKANSAS - Surveys negative in northwest area. (Ark. Ins. Sur.). OKLAHOMA - Ranged up to 700 per square foot of crown in 2 to 3-inch fall-planted alfalfa in Tipton area, Tillman County. (Okla. Coop. Sur.). ARIZONA - Light to moderate on most alfalfa in Yuma Valley and north Gila Valley of Yuma County. Moderate to heavy parasitism occurred in nearly all infestations. (Ariz. Coop. Sur.).

SMALL GRAINS

BROWN WHEAT MITE (*Petrobia latens*) - OKLAHOMA - Ranged 5-1,000 per linear foot on wheat in Cotton, 350-500 in Tillman, 50-600 in Washita and 10-80 in Beckham Counties. (Okla. Coop. Sur.). NEW MEXICO - Light to medium on wheat near Cotton City, Hidalgo County. (Campbell).

WINTER GRAIN MITE (*Penthaleus major*) - TEXAS - Infestations and damage remain same as last 2 weeks in Rolling Plains and in north and central areas. Controls being applied in several areas, but economics of applications questionable due to lack of moisture. (Turney, Parker). OKLAHOMA - Ranged 50-75 per linear foot in many wheat fields in Cotton and Tillman Counties. (Okla. Coop. Sur.).

ENGLISH GRAIN APHID (*Macrosiphum avenae*) - ARKANSAS - Remains very low in northwest area. (Ark. Ins. Sur.).

TURF, PASTURES, RANGELAND

RANGE CRANE FLY (*Tipula simplex*) - CALIFORNIA - Recurred in approximately same area in eastern Tulare County as the 1962 outbreak. Since many larvae have started to pupate, treatment was questionable. Infestation evident in several areas. Damage appearing in areas where cattle were pastured early before annual grass had sufficient growth to support both pest and animals. (Cal. Coop. Rpt.).

A CHINCH BUG (*Blissus insularis*) - TEXAS - Adult feeding noted in several lawns at Houston, Harris County. This early emergence probably due to unseasonably warm weather but could result in early buildups in advent of warm, late winter. (Hudson).

FORAGE LEGUMES

PEA APHID (*Acyrthosiphon pisum*) - ARIZONA - Light to moderate on alfalfa in Yuma County. Parasitism light in 80 percent of infestations. (Ariz. Coop. Sur.). NEW MEXICO - Generally light to medium on alfalfa in Chaves and Dona Ana Counties. (Mathews, Campbell). ARKANSAS - Remains low in northwest area. No significant increase expected until warmer weather. (Ark. Ins. Sur.). MISSISSIPPI - Moderate on alfalfa in Pontotoc County. (Dinkins).

ALFALFA CATERPILLAR (*Colias eurytheme*) - ARIZONA - Larvae light on alfalfa in northern Gila Valley, Yuma County. Adults very light in all areas. (Ariz. Coop. Sur.).

EGYPTIAN ALFALFA WEEVIL (*Hypera brunneipennis*) - ARIZONA - Larvae increasing rapidly on alfalfa; averaged 4 per terminal in Yuma County and 1-2 per terminal in Maricopa County. (Ariz. Coop. Sur.).

ALFALFA WEEVIL (*Hypera postica*) - MISSISSIPPI - Numbers unchanged in Lee County; averaged 25-30 larvae per square foot in Oktibbeha County. (Dinkins).

GENERAL VEGETABLES

CABBAGE LOOPER (*Trichoplusia ni*) - ARIZONA - Larvae light on 20 percent of lettuce in Yuma County; increase expected, since egg counts are moderate. (Ariz. Coop. Sur.).

CITRUS

Citrus Insect Situation in Florida - Mid-February 1967 - CITRUS RUST MITE (*Phyllocoptruta oleivora*) infested 70 percent of groves (norm 57 percent); 53 percent economic (norm 36 percent). Population is much above the February average and is in high range, and will remain high. CITRUS RED MITE (*Panonychus citri*) infested 56 percent of groves (norm 31 percent); 29 percent economic (norm 13 percent). Population is above normal and near high range. Increase into high range expected. Highest districts north, west and central. TEXAS CITRUS MITE (*Eutetranychus banksi*) infested 44 percent of groves (norm 26 percent); 26 percent economic (norm 8 percent). Population is at highest level for February in 15 years of record.

It is in moderate range at present but further increase expected. Highest districts are west and north. Texas citrus mite is less abundant than citrus red mite. SIX-SPOTTED MITE (*Eotetranychus sexmaculatus*) is still below average and very scarce. GLOVER SCALE (*Lepidosaphes gloverii*) infested 83 percent of groves; 18 percent economic. Population is above normal and in high range. Slight decrease expected. Highest districts are east, central and south. PURPLE SCALE (*L. beckii*) infested 78 percent of groves; 8 percent economic. Population is below average and in moderate range. Little change expected. Central district highest. YELLOW SCALE (*Aonidiella citrina*) infested 69 percent of groves; 15 percent economic. Population is above average and in moderate range. Slight decrease expected. Highest districts central and east. CHAFF SCALE (*Parlatoria pergandii*) infested 60 percent of groves; 5 percent economic. Population is much below normal and in low range; slight decrease expected. East district highest. BLACK SCALE (*Saissetia oleae*) infested 43 percent of groves; 16 percent economic. Population is above normal low level for February and will remain in low range. Highest districts east and central. WHITEFLIES are near average abundance with 64 percent of groves infested. MEALYBUGS are presently at low level and decreasing. (W. A. Simanton (Citrus Expt. Sta., Lake Alfred, Fla.)).

ORNAMENTALS

A PYRALID MOTH (*Herculia intermedialis*) - ILLINOIS - Larva collected from juniper in Champaign, Champaign County, November 10, 1966, by J. Nordin; adult was reared. Det. by R. W. Hodges. This is a new State record. (Ill. Ins. Rpt.).

AZALEA LEAF MINER (*Gracillaria azaleella*) - CALIFORNIA - Medium on azaleas at Santa Cruz, Santa Cruz County; this is an early occurrence. (Cal. Coop. Rpt.).

GLADIOLUS THRIPS (*Taeniothrips simplex*) - UTAH - Moderate in gladiolus corms stored at Logan, Cache County. (Knowlton).

APHIDS - CALIFORNIA - *Myzocallis arundinariae* nymphs and adults heavy on bamboo at Santa Barbara, Santa Barbara County. (Cal. Coop. Rpt.). ARIZONA - *Myzus persicae* heavy on ornamentals in all areas of Maricopa County. (Ariz. Coop. Sur.). NEW MEXICO - *Cinara* sp. light to heavy on arborvitae in Albuquerque. Heavily infested plants show large amounts of honeydew. (Heninger). OKLAHOMA - *C. tujafilina* continues light to moderate on evergreens in Payne County and moderate in Cleveland County. (Okla. Coop. Sur.). ALABAMA - *Macrosiphum rosae* heavy on numerous isolated roses in central area where early growth present. (McQueen). FLORIDA - *Myzus persicae* infesting roots of 10 percent of 1,000 aralia plants (*Acanthropanax sieboldianus*) at nursery in Clarcona, Orange County. (Ware, Feb. 7).

ARMORED SCALES - FLORIDA - All stages of *Pseudaulacaspis pentagona* infested 15 Chinese privet plants at Jacksonville, Duval County. (King, Feb. 16). *Acutaspis morrisonorum* light on leaves of a Canadian hemlock in nursery at Florahome, Putnam County. This is a new host record. (Graham, Feb. 10). CALIFORNIA - *Hemiberlesia lantaniae* medium on rusty fig nursery stock at San Diego and heavy on dracena in a trailer park at Escondido, San Diego County. *Aspidiotus nerii** medium on oleander nursery stock at Thermal, Riverside County. (Cal. Coop. Rpt.).

A PIT SCALE (*Cerococcus deklei*) - FLORIDA - Collected on gardenia at Miami, Dade County, during January and on Barbados-cherry at North Miami, Dade County, February 16. These both new host records. (Wartman et al.).

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*The scientific name of oleander scale (*Aspidiotus hederae* (Vallot)) has been changed to *Aspidiotus nerii* Bouché. See Morrison, H. H. and Morrison, E. R. 1966. USDA Misc. Pub. 1015:17.

A LEAF MINER FLY (*Melanagromyza viridis*) - CALIFORNIA - Medium in asters of seed production units at *Santa Paula, Ventura* County. Collected and reared by R. M. Jefferson. Det. by M. Wasbauer and confirmed by K. A. Spencer. (Cal. Coop. Rpt.).

ERIOPHYID MITES - ALABAMA - *Acaphylla steinwedeni* and *Calacarus adornatus* heavy on 25 young camellias in backyard planting in Auburn, Lee County. Browning progressive as mites increase. (McQueen). CALIFORNIA - *Diptacus swensoni* adults medium on English holly nursery stock at Millbrae, San Mateo County. (Cal. Coop. Rpt.).

CLOVER MITE (*Bryobia praetiosa*) - CALIFORNIA - Adults medium on ivy at San Francisco. Infestations at this time of year may indicate heavy household infestations. (Cal. Coop. Rpt.).

FOREST AND SHADE TREES

FOREST TENT CATERPILLAR (*Malacosoma disstria*) - TEXAS - Survey indicated very light larval infestations for Bexar, Guadalupe, Caldwell and Bastrop Counties. No egg capsules found at several sites in each county at 15 to 20 mile intervals. This year is the fourth year since a sporadic, heavy infestation has occurred. (Parker).

A BARK BEETLE (*Phloeosinus* sp.) - CALIFORNIA - Adults heavy on cypress at Lucerne Valley Park, Lucerne, San Bernardino County. (Cal. Coop. Rpt.).

ARBORVITAE APHID (*Cinara tujafilina*) - CALIFORNIA - Nymphs and adults heavy on juniper at Huntington Beach, Orange County. (Cal. Coop. Rpt.).

EUROPEAN ELM SCALE (*Gossyparia spuria*) - CALIFORNIA - Medium on elm at Escondido, San Diego County. (Cal. Coop. Rpt.).

A SPIDER MITE (*Eotetranychus libocedri*) - CALIFORNIA - Eggs and adults infested juniper at Highland, San Bernardino County. (Cal. Coop. Rpt.).

SMALL FRUITS

STRAWBERRY APHID (*Chaetosiphon fragaefolii*) - CALIFORNIA - Nymphs and adults medium on strawberry plantings in San Dimas, Los Angeles County. (Cal. Coop. Rpt.).

MAN AND ANIMALS

MOSQUITOES - LOUISIANA - Larval collections in Jefferson Parish contained *Aedes triseriatus*, *A. vexans*, *Culex restuans*, *C. salinarius*, and *Culiseta inornata*. Light trap collections increased in many sections of parish. Counts highest in Grand Isle area. Floodwater species increased slightly throughout parish. (Stokes).

NORTHERN FOWL MITE (*Ornithonyssus sylviarum*) - MISSISSIPPI - Light to moderate in commercial chicken houses in Oktibbeha County. (Dinkins).

EAR TICK (*Otobius megnini*) - TEXAS - Moderate on several cattle near Canton, Van Zandt County. (Dean).

CATTLE LICE - ALABAMA - *Bovicola bovis* and *Haematopinus eurysternus* were heavy on several cattle herds in Bullock County. Controls applied. (Stone).

COMMON CATTLE GRUB (*Hypoderma lineatum*) - OKLAHOMA - Averaged 2-3 per head on steers and 4 per head on cows in Payne County, 2-20 per head in 40 percent of cattle in Marshall County and moderate in Cleveland and Mayes Counties. (Okla. Coop. Sur.).

SCREW-WORM (*Cochliomyia hominivorax*) - One case reported in U. S. February 19-25, from Medina County, Texas. Total of 59 cases reported in portion of Barrier Zone in Republic of Mexico February 12-19 as follows: Baja California 1, Territorio sur de Baja California 20, Sonora 30, Chihuahua 5, Tamaulipas 3. Three cases reported from Mexico south of Barrier Zone. Barrier Zone is area where eradication operations are underway to prevent establishment of self-sustaining population in U. S. Sterile screw-worm flies released: Texas 14,768,000, Mexico 85,058,000. (Anim. Health Div.).

HOUSEHOLDS AND STRUCTURES

SMALLER EUROPEAN ELM BARK BEETLE (*Scolytus multistriatus*) - IOWA - Collected in firewood at home in Leon, Decatur County. (Iowa Ins. Sur.).

SUBTERRANEAN TERMITES (*Reticulitermes* spp.) - MARYLAND - Winged forms swarmed in several homes in Prince Georges County. Workers damaged oak floors in home at Wheaton, Montgomery County. (U. Md., Ent. Dept.).

FEDERAL & STATE PLANT PROTECTION PROGRAMS

GRASSHOPPERS - OKLAHOMA - Four rangeland stops in Ellis and Roger Mills Counties averaged 0.33 egg pod per square foot of sod; 15 rangeland stops in 4 south-central counties averaged 0.33 viable egg pod per square foot. No egg pods were found at 4 stops in Pontotoc County. Desiccated, fungus-infested pods were numerous in south-central area. (Okla. Coop. Sur.).

ORIENTAL WOOD BORER (*Heterobostrychus aequalis*) - FLORIDA - Special survey for this beetle is continuing. (Fla. Coop. Sur.).

FORMOSAN SUBTERRANEAN TERMITE (*Coptotermes formosanus*) - Inspections were made in Louisiana, Mississippi, South Carolina, Tennessee and Texas. Two properties were found infested in New Orleans, Louisiana; all other inspections negative. (PPC, South. Reg., Jan. Rpt.). Several inspections made in California; all negative. (PPC, West. Reg., Jan. Rpt.).

GYPSY MOTH (*Porthetria dispar*) - MICHIGAN - Survey for egg masses conducted in Clarence Township, Calhoun County. Approximately 1,070 acres checked; none found at 8 positive trap sites but very heavy numbers of egg masses were found in a swampy area within 40-acre infested area on northeast shore of Duck Lake. (PPC, Cent. Reg., Jan. Rpt.).

PINK BOLLWORM (*Pectinophora gossypiella*) - ARIZONA - Larvae collected in bolls on soil surface of 2 fields planted to grain and in fields that were plowed in Parker area, Maricopa County. (Ariz. Coop. Sur.).

CITRUS BLACKFLY (*Aleurocanthus woglumi*) - MEXICO - *Chemical Control Zone* - Total of 40,021 trees inspected on 1,792 properties in 9 municipios. One infestation was found in a backyard planting at Linares, Nuevo Leon. Total of 21,770 trees on 27 properties were sprayed in 2 municipios of Nuevo Leon. At Hualahuises, 21,530 trees were given second and/or third application and 240 trees were given initial treatment. (PPC Mex. Reg., Jan. Rpt.). TEXAS - Inspections of 115 trees at 5 properties negative in Hidalgo County. (PPC, South. Reg., Jan. Rpt.).

IMPORTED FIRE ANT (*Solenopsis saevissima richteri*) - FLORIDA - Adults collected at Lowell, Marion County. This is a reinfestation; previously found at Fellowship in December 1957, treated and considered eradicated. (Graham, Feb. 20).

INSECT DETECTION

New United States Record

A LEAF MINER FLY (*Melanagromyza splendida*) - CALIFORNIA - Medium populations found in stems of *Helianthus* sp. in August 1966, in seed production units at Santa Paula, Ventura County. Collected and reared by R. N. Jefferson. Det. by M. Wasbauer and confirmed by K. A. Spencer. *M. splendida* is a polyphagous species described from Hawaii and found in Jamaica. (Cal. Coop. Rpt.).

New State Record

A PYRALID MOTH (*Herculia intermedialis*) - ILLINOIS - Larva collected from juniper at Champaign, Champaign County, November 10, 1966. Det. by R. W. Hodges. (p. 133).

CORRECTIONS

CEIR 17(4):44 - TEXAS - ENGRAVER BEETLES (Ips spp.), I. grandiocollis should read I. grandicollis.

LIGHT TRAP COLLECTIONS

FLORIDA - Gainesville, 2/21, 1 BL - Black cutworm (*Agrotis ipsilon*) 1, granulate cutworm (*Feltia subterranea*) 1. SOUTH CAROLINA - Charleston, 2/13-19, 1 BL, temp. 33-76°, precip. 0.50 - Granulate cutworm 4, armyworm (*Pseudaletia unipuncta*) 1. TEXAS - Brownsville, 2/11-12, 2 BL, temp. 36-85°, no precip. - Salt-marsh caterpillar (*Estigmene acrea*) 7, black cutworm 46, granulate cutworm 130, armyworm 48, yellow-striped armyworm (*Prodenia ornithogalli*) 140, variegated cutworm (*Peridroma saucia*) 6, tobacco budworm (*Heliothis virescens*) 2.

HAWAII INSECT REPORT

Vegetables - IMPORTED CABBAGEWORM (*Pieris rapae*) adults and larval damage heavy on small cabbage plantings at Puunene, Maui. (Miyahira).

Fruits - Adults of a SCARAB (*Protaetia fusca*) medium on mango blossoms in Pukalani, Maui, and Waimanalo, Oahu. Adults normally common on mango this time of year when most trees are flowering. (Miyahira, Suzukawa). A BARK BEETLE (*Xylosandrus compactus*) light on coffee at residential property in Hilo, Hawaii Island; also medium on grape and heavy on avocado at same property. Heavy on koahaole (*Leucaena leucocephala*) seedlings and light on nohu (*Tribulus cistoides*) in Mokuleia, Oahu. These are new host records and most northwesterly occurrence on island. Medium on koa on Mt. Kaala, Oahu, at 2,500 feet elevation. This is also a new host record. (Yamayoshi et al.).

Ornamentals - An ARMORED SCALE (*Phenacaspis cockerelli*) medium to heavy on oleander and rose-flowered jatropha (*Jatropha hastata*) in nursery in Waimanalo, Oahu. (Funasaki).

Beneficial Insects - A TEPHRITID FLY (*Tetraeuaresta obscuriventris*) adults medium to heavy on elephants-foot (*Elephantopus mollis*), a noxius weed and pasture pest, in Kalaheo, Lawai and Omao, Kauai. Averaged 45 per 5 sweeps. This seed feeder was introduced from Fiji and became established in February 1962. (Au).

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1966

(continued from page 127)

CORN, SORGHUM AND SUGARCANE

Highlights:

EUROPEAN CORN BORER was heavier in practically all States reporting. In several North Central States, populations were more than double those of 1965. SOUTHWESTERN CORN BORER was similar to 1965; however, it was reported in several new counties. NEOTROPICAL CORN BORER was reported for first time in U.S., from Texas. BLACK CUTWORM was serious in young corn in Delaware and on the Eastern Shore of Maryland. FALL ARMYWORM was a problem on corn in Florida, Alabama and Arkansas. CORN ROOTWORMS continued to spread to new counties; however, damage was low this season. CORN FLEA BEETLE caused heavy damage to corn in Delaware, Maryland, and Ohio during the summer. CHINCH BUG was not a problem in corn this year. SORGHUM MIDGE caused severe losses to grain sorghum in several areas of Texas.

EUROPEAN CORN BORER (Ostrinia nubilalis) was light to medium on corn this year in VIRGINIA. Populations were medium in the southwest area during early July and the lightest in 20 years in Rockbridge County. Populations were above normal in MARYLAND with whorl and stalk infestations ranging 20-80 percent during late June and early July in most sections. Moth numbers peaked in late August on the Eastern Shore. Infestations were moderate to heavy in DELAWARE, averaging 307 borers per 100 plants, a 32-percent increase over the 1965 fall population. This is the fourth consecutive year of borer increase in the State. Infestations were moderate to severe on sweet corn in NEW JERSEY and light in PENNSYLVANIA with only occasional fields damaged. A slight increase in damage over last year occurred in CONNECTICUT, and no change was noted in RHODE ISLAND. Percent of plants infested in VERMONT during 1966 was 14.0 compared with 5.6 in 1965. Corn in northwest Vermont was most heavily infested.

European corn borer occurred throughout northern ALABAMA in corn and grain sorghum, being most serious on late plantings. Borers damaged late corn as far south as Autauga County. Borers per 100 stalks increased over 1965 in ARKANSAS, also infesting late sorghum. Pupation was 100 percent complete in Pemiscot and New Madrid Counties, MISSOURI, by May 14. Damage averaged 11.6 percent in 2 northwest counties and was common throughout corn-growing areas of the State. Percent of infested stalks was 82.2 compared with 61.1 in 1965 and the number of borers per 100 stalks was 299.6 compared with 145.2 in 1965. Damage to corn this season was higher than in 1965 in KANSAS, particularly in the northeast area. Many fields were treated during August. Fall survey showed populations 2-3 times higher in northeast and east-central areas than in 1965. European corn borer was higher throughout NEBRASKA than in 1965. Overwintering larvae were at low levels in SOUTH DAKOTA, with less than 15 per 100 stalks. Six percent parasitism was attributed to a eulophid wasp (Sympiesis viridula) and 5 percent to an ichneumon wasp (Diadegma punctoria). Larvae damaged up to 10 percent of the whorls of corn in Lincoln, Hutchinson, and Charles Mix Counties, and 35-40 percent of the whorls in Yankton County. By mid-July, heavy damage occurred to untreated corn in northern Yankton County with 3-4 first-brood larvae per corn plant and 90 percent of plants infested. However, first-brood damage was lower than in 1965. The second-brood populations increased in most of eastern South Dakota, and except in a few south-central and southeastern counties, were at highest levels in the past 4 years. Mortality of overwintering larvae was 21 percent in NORTH DAKOTA compared with 27 percent in 1965. Pupation occurred June 13 compared with June 1 in 1965. The fall abundance survey indicated an increase in all counties with an average of 75 percent infested plants and 211 borers per 100 plants. Stalk breakage was evident in some heavily infested fields. European corn borer was found for the first time in Bowman, Slope, Golden Valley, Mountrail, and Rolette Counties. Infestations were also found in potatoes and sorghum. Populations were normal at Glendive, MONTANA.

Overwintering mortality of European corn borer larvae ranged 0-4 percent in MINNESOTA, the lowest in many years. Cool weather delayed pupation and egg laying until late June. The first generation was low throughout the State, while an increased second generation started in late July. Fall abundance surveys indicated high numbers in the northwest district. Moderage populations represent a potential threat in southwest, south-central and west-central districts. Overwintering larvae were scarce in WISCONSIN. Population was noted May 27 and first moths of the season were collected in Walworth County June 10. Eggs began hatching July 1, and continued until mid-July. By late September all second-generation larval stages were present. Compared with 1965, larvae were more numerous, but of little economic importance except from the sanitation aspect of canning sweet corn. Winter survival was 10-15 percent higher than normal in ILLINOIS. Planting dates ranged from very early to very late in most areas of the State thus conditions for larval development were excellent. The first-generation survey showed an average of 4.77 borers per 100 plants or a 124-percent increase over 1965. Only 16.8 percent of larvae were infested with microsporidiosis. Second-generation surveys showed an average of 112 borers per 100 plants or twice as many as in 1965 with 20.9 percent of the borers infected with microsporidiosis. Other parasites were very low. An estimated 49,400 acres of corn were treated in Illinois. European corn borer was slightly higher in INDIANA during 1966 than in 1965. Statewide, 30.6 percent of the plants sampled were infested with 44.3 borers per 100 plants. Corn losses were 1.3 percent for 1966. In southwestern Indiana, first-generation larvae were heavier than in several years. Infestations ranging up to 68 percent were common in Posey, Vanderburgh, and Gibson Counties during late June. Adults were taken at blacklight traps during first week of June in MICHIGAN. Collections indicated a very heavy flight during mid-June. The first larval brood was the highest experienced in Michigan during recent years. Leaf-feeding injury by first-brood larvae was more common this season, especially on some corn hybirds. Second-brood adults started appearing in blacklight traps during late July. Losses were light, however, averaging less than 2 percent grain equivalent reduction. Hybrids with borer resistance and borer tolerance bred in, along with favorable weather and cultural practices, led to excellent corn yields in Michigan this year. Borer injury to peppers and potatoes occurred in some areas. Larvae were low during the spring in northwest OHIO. Infestations in sweet corn were common in the southeastern area during September. A survey of 23 corn fields in Van Wert County indicated light populations compared with the previous year. For Status of European corn borer, fall 1966, see CEIR 17(4):46-52.

SOUTHWESTERN CORN BORER (Zeadiatraea grandiosella) was serious on corn in northwest and north-central ALABAMA, with light infestations observed as far south as Washington County. New county records included Wilcox and Marshall, making a total of 30 counties infested. Infestations were comparable with 1965 in ARKANSAS with some late corn damaged. Southwestern corn borer was light on corn in southwestern OKLAHOMA during June, but overwintering larvae were again common in corn stalks in many areas during fall and winter months. Larvae heavily damaged sorghum fields in many areas of Maricopa, Pinal, Pima and Cochise Counties, ARIZONA. Populations peaked during August and September. Southwestern corn borer caused little damage this season in KANSAS. Adults were first trapped at Portageville, MISSOURI, June 2. Most damage in Missouri was confined to late-planted corn in the southeast area. New county records included Perry, Madison, and Bollinger. New County records in ILLINOIS included Jackson, Williamson, and Saline. Percent of girdled stalks in the 7 previously infested counties increased from 1.73 percent in 1965 to 3.66 percent in 1966. A few fields had over 20 percent of the plants girdled. Southwestern corn borer was present in every field examined in 5 Illinois counties.

NEOTROPICAL CORN BORER (Zeadiatraea lineolata) was collected for the first time in TEXAS and the United States during 1966. Neotropical corn borer and SUGARCANE BORER (Diatraea saccharalis) infested many fields of corn and grain sorghum in Cameron and Hidalgo Counties. Many fields contained heavy populations and damage by Neotropical corn borer appeared to be more severe than by either sugarcane borer or SOUTHWESTERN CORN BORER (Z. grandiosella). Southwestern corn borer was light and scattered in northern portion of State. Sugarcane borer remained confined to southern Texas, but damage was heavier than in recent years, especially along the gulf coast.

SOUTHERN CORNSTALK BORER (Diatraea crambidoides) was associated with other corn borers in late corn in northern ALABAMA. Infestations were light as far south as Lee County. STALK BORER (Papaipema nebris) was observed on corn in MISSOURI and was light in many corn fields in southeast and east-central KANSAS during July, but no economic damage was observed. Stalk borer was light on corn and sorghum in NEBRASKA and damaged borders of corn fields in Lincoln County by July. LESSER CORNSTALK BORER (Elasmopalpus lignosellus) larvae heavily damaged late-planted sorghum during the summer in ARIZONA. Populations peaked during August in Yuma, Maricopa and Pinal Counties.

BLACK CUTWORM (Agrotis ipsilon) caused heavy damage to late-planted corn following flooding along the Black River in northeast ARKANSAS. The first adult of the season was trapped at Portageville, MISSOURI, on March 28. Larval damage was light and scattered throughout the State. Black cutworm caused little damage to corn this year in KANSAS, and no damage was reported in NEBRASKA. Moths began emerging May 20 in WISCONSIN, with larval damage to corn noted 3 weeks later. Damage to young corn was severe in a few widely scattered fields. Cutworms, mainly black cutworm, were not as abundant in ILLINOIS as in 1965. A total of 122,521 acres received postemergence treatments compared with 411,633 acres in 1965. Likewise, 146,493 acres were replanted this year compared with 265,320 acres in 1965. Black cutworm infestations occurred mainly in central INDIANA, with highest numbers in the west-central area. Generally, infestations were fewer in number and lighter during 1966 than 1965. Black cutworm was serious on young corn, especially after sod, on the middle and upper Eastern Shore of MARYLAND. Corn was heavily damaged in several areas of DELAWARE during June. Black cutworm was more serious on sweet corn during the spring of 1966 than in 1965 in FLORIDA.

VARIGATED CUTWORM (Peridroma saucia) and GRANULATE CUTWORM (Feltia subterranea) heavily damaged sorghum in Yuma, Maricopa, and Pinal Counties, ARIZONA, during April and May. Many sorghum fields were replanted. Economic numbers of PALE WESTERN CUTWORM (Agrotis orthogonia) occurred on corn in some parts of northeastern COLORADO. WESTERN BEAN CUTWORM (Loxagrotis albicosta) adults were first observed in corn in Hall County, NEBRASKA, July 15, with larval populations building up in late August and September. Some controls were applied. Western bean cutworm was reported for the first time in Colfax County. Populations were higher in Hall County than in 1965. Variegated cutworm damage was very light during 1966 in INDIANA and adult trap collections were well below those in 1965. DARK-SIDED CUTWORM (Euxoa messoria) caused severe injury to several corn fields in southwestern PENNSYLVANIA. BRONZED CUTWORM (Nephelodes emmedonius) damaged some corn in VERMONT. GLASSY CUTWORM (Crymodes devastator) was unusually numerous in NEW HAMPSHIRE and caused 50 percent reduction in a stand of silage corn.

FALL ARMYWORM (Spodoptera frugiperda) severely damaged young sweet corn during the fall at Sanford, Seminole County, FLORIDA. This species was heavy on late corn and sorghum throughout ALABAMA and caused damage to late corn in ARKANSAS. Numbers were light to moderate in corn, sorghum, broomcorn and other crops from late July through early October in OKLAHOMA. Populations on corn were economic in southeastern and western COLORADO, with some controls applied. Fall armyworm was light throughout the summer in KANSAS and light in eastern and central NEBRASKA during August. Populations were observed on corn in MISSOURI and caused little damage in ILLINOIS. Infestations were moderate to severe on sweet corn in NEW JERSEY and damaged field corn at Foster and Lincoln, RHODE ISLAND.

YELLOW-STRIPED ARMYWORM (Prodenia ornithogalli) caused very little damage to sorghum in Lincoln and Dakota Counties, NEBRASKA.

CORN ROOT WEBWORM (Crambus caliginosellus) infested young corn planted after sod in all sections of MARYLAND and replanting was necessary in several instances. Larvae damaged corn in New Kent, Culpeper, Franklin, and Montgomery Counties, VIRGINIA, during June. This species attacked several fields of corn in Greene County, OHIO, and reduced the stand. Unspecified webworms were more common this year on corn in MINNESOTA, but damage was generally light. SOD WEBWORMS damaged corn at Terry, MONTANA, and were reported in lawns at Circle and Helena. SORGHUM WEBWORM (Celama sorghiella) was generally moderate in central TEXAS, but was heavy in Brazos, Williamson, Burleson, Gonzales, Falls, and Limestone Counties. Sorghum webworm damaged isolated grain sorghum fields in ALABAMA. Sugarcane in the Belle Glade area of FLORIDA was heavily damaged by larvae of a LEAF-ROLLING PYRALID (Marasmia trapezalis) during September while cane was young.

NORTHERN CORN ROOTWORM (Diabrotica longicornis) did not increase in DELAWARE; only collections were in blacklight traps during August in New Castle County. Adults caused conspicuous injury to silks of field corn during early August in western Carroll County, MARYLAND, and were collected on silks in western PENNSYLVANIA. Adults were fewer than in 1965 in western and northwestern OHIO and incidence of stalk lodging was low in spite of much late-planted corn. SOUTHERN CORN ROOTWORM (D. undecimpunctata howardi) adults were common on tassels of field corn in Ohio, infesting up to 20 percent of silks, but were generally, not sufficiently numerous to cause serious damage. Northern corn rootworm was spotty this season in MICHIGAN and overall losses were lower than in recent years. Adults ranged 6-23 per ear in scattered untreated corn fields throughout central INDIANA and ranged 1-4 per ear in treated fields. Generally, populations were low in 1966, and little lodging occurred. Adults were abundant in ILLINOIS, ranging 0-34 per ear tip during early August. Only late fields were damaged and some lodging was caused by larvae. Resistance to chlorinated hydrocarbons is slowly increasing. WESTERN CORN ROOTWORM (D. virgifera) adults began emerging in Mercer County, Illinois, July 7. This species was recorded for the first time in Henry, Whiteside, Lee, and Woodford Counties bringing the total to 10. Infestations were heaviest in Rock Island, Mercer, Henderson, and Warren Counties. Northern corn rootworm adults were high in many fields in WISCONSIN during August, but western corn rootworm populations were low. Survey completed in August revealed adults in Polk, Dunn, St. Croix, Pierce, Buffalo, Pepin, Trempealeau, Vernon, Grant, Dane, and Columbia Counties. Eggs of northern and western corn rootworms hatched one week later than in 1965 in MINNESOTA. Larvae developed more rapidly in 1966 due to hot weather. Some lodging was observed by late July, after heavy rains. Adult surveys in the southern half of the State indicated an increase in percentage of western corn rootworm in 60 percent of the counties; however, the total population decreased. Northern corn rootworm remains dominant in Minnesota.

First-stage western corn rootworm larvae were first noted June 21 in Lincoln, Clay, Yankton, and Hutchinson Counties, SOUTH DAKOTA. During first week of August, adults reached peaks of 40-80 per stalk, with emergence well ahead of silking. Northern corn rootworm was light through most of July and began to increase in August, especially in Lake and Buffalo Counties. Corn rootworm adults began emerging in southern NEBRASKA in July and were 50-75 percent emerged by the end of July. Western corn rootworm was dominant. Corn rootworm damage was less than in 1965. Northern corn rootworm appeared more widespread than in 1965, while southern corn rootworm was lighter and less widespread than in 1965. Corn rootworms were light in most areas of KANSAS, and little damage was reported except for a few untreated fields in the northeast section. High numbers of western and northern corn rootworms, up to 25 per plant, were found in many east-central fields in August. First western corn rootworm larvae of season in MISSOURI were observed June 7 in Atchison County, and damage was observed in untreated fields throughout the northwest area. Sixteen new counties were found infested. Northern corn rootworm infested corn in Clay County, ARKANSAS, but is seldom found in State. In TEXAS, northern corn rootworm spread into Gonzales, Nueces, Washington, Guadalupe, Fayette, Bee, and Austin Counties, all new records. Damage was economic in several instances. Northern corn rootworm is found in NEW MEXICO, but is still below economic levels. More problems are expected, however, because of the recent switch to continuous corn production. Controls on corn were necessary in some areas of COLORADO where adults and larvae of western corn rootworm were active in eastern and northeastern areas. First adults of northern and southern corn rootworms were collected in southeastern WYOMING July 20. Damage to silks was not evident until August 3. Adults averaged 6-10 per plant in more heavily infested fields. Adult damage to silks and larval damage to roots were less than in 1965. WESTERN SPOTTED CUCUMBER BEETLE (*D. undecimpunctata undecimpunctata*) adults reduced sweet corn yields in Douglas County, OREGON, by feeding on silks.

CORN FLEA BEETLE (*Chaetocnema pulicaria*) adults were medium to heavy on young field and sweet corn during the summer in all sections of MARYLAND and caused heavy damage to young corn especially in New Castle County, DELAWARE. Young corn plants were severely damaged in many fields in OHIO with up to 20 or more adults per plant. Corn flea beetle was economic in Kosciusko, Randolph, Monroe and Green Counties, INDIANA, where adults ranged 2-5 per seedling corn plant during late May. Generally, populations were much lighter in 1966 than in 1965, especially in southern Indiana. Corn flea beetle was relatively light this year in ILLINOIS, with an estimated 5,117 acres treated compared to 35,951 acres in 1965. Adults damaged seedling corn up to 24 inches high throughout ALABAMA.

DESERT CORN FLEA BEETLE (*C. ectypa*) moderately damaged seedling corn and sorghum during late spring and early summer in ARIZONA, and necessitated replanting 3 percent of sorghum in Yuma and Maricopa Counties.

A FLEA BEETLE (*Systena frontalis*) infested weeds and corn in Lincoln County, SOUTH DAKOTA; although numbers were high, no economic losses were observed.

A SAP BEETLE (*Glischrochilus quadrisignatus*) was abundant and widespread in the northern two-thirds of ILLINOIS, apparently attracted to corn heavily infested by corn leaf aphid. Larvae were abundant in sweet corn infested with corn earworm in Umatilla County, OREGON, during September.

DUSKY SAP BEETLE (*Carpophilus lugubris*) larvae and adults were numerous in sweet corn during August in DELAWARE. BUMBLE FLOWER BEETLE (*Euphoria inda*) was a local problem on corn in MONTANA, being reported from Havre, Fort Benton, Billings, Chinook and Lewistown. A WEEVIL (*Hyperodes humilis*) caused heavy damage to some fields of sweet corn at Belle Glade, FLORIDA, during late August.

WIREWORMS caused serious damage to corn seed and seedlings at Little Compton and Warren, RHODE ISLAND, in mid-June with some fields being replanted. In CONNECTICUT, damage increased, probably because of continuous corn production. WHEAT WIREWORM (*Agriotes mancus*) was associated with the corn root webworm in some fields in PENNSYLVANIA. Another WIREWORM (*Melanotus communis*) damaged sweet corn in the spring at Belle Glade, FLORIDA, where control was not satisfactory. Wheat wireworm infested corn and milo more frequently during the spring in SOUTH DAKOTA. Infestations were spotty, as in previous years, but damage was more pronounced. Scattered, light infestations of unspecified wireworms occurred on corn in southwest MINNESOTA.

SOIL INSECTS were responsible for an estimated 5,443,197 acres of corn being treated during or before planting in ILLINOIS during 1966.

GRASS THRIPS (*Anaphothrips obscurus*) and a THRIPS (*Frankliniella tenuicornis*) were present in most corn fields throughout ILLINOIS and caused light silvering of lower leaves in many fields by late June.

BEAN APHID (*Aphis fabae*) was unusually abundant and damaging on corn in the Yakima Valley and Columbia Basin of WASHINGTON. CORN ROOT APHID (*Anuraphis maidiradicis*) was low in southeast SOUTH DAKOTA from mid-June through July;

however, populations were higher than in 1965.

CHINCH BUG (Blissus leucopterus) was not a problem on corn this year in OHIO, and was practically nonexistent in INDIANA. Adults and nymphs ranged 20-60 per border row corn plant (3-4 feet high) in east-central Indiana, with economic infestations reported in scattered areas of Allen, Whitley and Grant Counties. Chinch bug populations were very low in ILLINOIS, where approximately 2,443 acres of corn were treated compared with 45,184 acres in 1965. In MISSOURI, numbers were very low. Hibernation surveys showed populations to be noneconomic in 11 counties and light in one county. Chinch bug became active during early June in OKLAHOMA, and heavy populations damaged sorghums in scattered areas during late June, July and early August. Activity continued until early September in Oklahoma and was a potential threat to most corn and grain sorghum in the Rolling Plains, north, central, and gulf coast areas of TEXAS. Chinch bug was lighter than usual in central and southern ALABAMA.

Unspecified STINK BUGS were serious on grain sorghum in the Tucumcari area of NEW MEXICO.

CONCHUELA (Chlorochroa ligata) was widespread on grain sorghum in TEXAS with some control necessary.

SORGHUM MIDGE (Contarinia sorghicola) was found for the first time in Douglas, Jefferson, Leavenworth and Shawnee Counties, KANSAS, but not at damaging levels. Sorghum midge caused severe damage and high losses throughout central and gulf coast areas of TEXAS because of late planting of grain sorghum. This midge was reported for first time in the Trans-Pecos area of the State.

CARMINE SPIDER MITE (Tetranychus telarius) was light on corn in east-southeast ILLINOIS in June but caused no serious damage. Tetranychus spp. caused little or no damage to corn in KANSAS but were heavy on corn over most of NEBRASKA. Economic damage was observed in Cuming and Saunders Counties. This is the farthest east spider mite damage has been observed in Nebraska. Populations were much higher than in 1965. Spider mites were first noted in Platte and Goshen Counties, WYOMING, July 20. Populations steadily increased and in some instances caused the loss of the lower fourth and fifth leaves. Chemical control was only moderately successful. TWO-SPOTTED SPIDER MITE (T. urticae) populations were economic on corn in several areas of COLORADO, with some controls necessary. Populations were low to moderate on sorghum, with no controls applied. Tetranychus spp. were medium to heavy on corn in Churchill and Pershing Counties, NEVADA, during late summer and required treatment. Infestations were generally light in other counties except in Lincoln County where they were above the 1965 level. Two-spotted spider mite infested corn in most areas of CALIFORNIA with damage appearing late in the season. This spider mite continued as a severe problem on corn in WASHINGTON.

GARDEN SYMPHYLAN (Scutigerella immaculata) infested corn in west-central and southwestern OHIO from mid-June to mid-July. Infestations on field corn may have increased in 1966. In INDIANA, losses to field corn were observed for the first time. Infestations ranged 1-8 acres in Clinton, Shelby and Harrison Counties, with significant yield losses in each instance. Garden symphylan also damaged seedling corn in a few areas of CALIFORNIA.

SLUGS injured corn plants in Lenawee, Clinton, Shiawassee and Eaton Counties, MICHIGAN, during late June. Most severely damaged fields had an abundance of decaying organic matter nearby.

SMALL GRAINS

Highlights:

ENGLISH GRAIN APHID was common on small grains early in the season in several areas but populations either did not increase or declined and were noneconomic. Survival of first-generation CHINCH BUG nymphs was high in KANSAS due to a mild, dry spring. Survey indicated higher overwintering populations than in 1965 and that they were uniformly distributed throughout the eastern half of Kansas. HESSIAN FLY infestations ranged as high as 35 percent in some Ohio wheat fields but populations were slightly lower in Indiana than in 1965. Populations increased greatly in Illinois compared with the previous year. Hessian fly spread westward and southwestward in Kansas as the result of change from resistant to susceptible wheat varieties. Greater losses may be expected in this area of the State. Many severe infestations in early planted fields reduced fall pasture and will contribute to winter kill in many fields in Kansas. BARLEY THRIPS was economic throughout North Dakota. BROWN WHEAT MITE damaged small grains in Texas, Oklahoma and Kansas, with some controls applied; infestations occurred on small grains in widely scattered areas of Montana. WINTER GRAIN MITE damaged small grains in north-central Texas in late winter and early spring, and became moderate to heavy in several areas of Oklahoma during March and April. WHEAT STEM SAWFLY infested 12.5-100 percent of fields in 20 western counties of North Dakota, but infestations were less severe in Ohio than in 1965.

ENGLISH GRAIN APHID (Macrosiphum avenae) was present in wheat from January through April in OKLAHOMA, but counts seldom averaged above 40 per linear foot. Fall activity began in mid-October with light numbers present the rest of the year. This aphid was present but noneconomic in ARKANSAS, and remained very light throughout the season in KANSAS, causing no damage. English grain aphid was heavy on Wocus barley in Douglas County, OREGON, during May, but by the end of June, syrphid flies and other predators had reduced populations in unsprayed fields. Scattered infestations in Klamath County caused some difficulties in harvesting operations. Light populations were evident the first week of June in NORTH DAKOTA, but remained noneconomic. Populations were common on oats in eastern SOUTH DAKOTA during the spring, but overall counts and infestations were low. Winged forms were observed in grain fields in Racine and Rock Counties, WISCONSIN, by April 22, at which time reproduction was already underway. English grain aphid ranged 160-1,360 per 100 sweeps on wheat just starting to head in southern ILLINOIS in early May, but populations declined thereafter and no damage occurred. Populations were higher in OHIO this year than in 1965. Infestations did not build up until much of the grain was headed and beyond the point where serious damage would have occurred. Counts ranged 1-18 aphids per sweep. English grain aphid ranged light to medium on barley and wheat in all sections of MARYLAND in 1966.

APPLE GRAIN APHID (Rhopalosiphum fitchii) remained very light throughout the season in KANSAS, and caused no damage. In TEXAS, the usual light populations occurred throughout the High Plains, Rolling Plains, and northern and central areas on small grains with no economic damge reported. GREEN PEACH APHID (Myzus persicae) occurred in trace numbers on volunteer barley late in the season in NORTH DAKOTA.

AN APHID (Rhopalosiphum padi) was present on oats from January through April in OKLAHOMA. Counts averaged 300-550 per linear foot in scattered fields in the western two-thirds of the State, but most populations were much lighter. All counts were light except in Carter County, where numbers ranged up to 450 per linear foot in early November. R. padi was common on oats in eastern SOUTH DAKOTA during the spring. Overall counts and infestations were low. A subterranean APHID (Forda olivacea) was found in South Dakota for the first time since 1963. WESTERN WHEAT APHID (Brachycolus tritici) was present on barley in north-central and far eastern MONTANA.

CHINCH BUG (Blissus leucopterus) populations were very low in ILLINOIS. An estimated 1,695 acres of small grains were treated compared with 13,523 in 1965. In KANSAS, survey in 1965 indicated light overwintering numbers. A mild, dry spring in 1966, however, resulted in high survival of first-generation nymphs. By mid-June, populations had increased to damaging levels on seedling sorghum in many fields in the eastern third of the State, and a large acreage was treated during July. Survey in 1966 indicated that overwintering populations were considerably higher than last year and were quite uniformly distributed throughout the eastern half of the State.

A FALSE CHINCH BUG (Nysius sp.) was heavy on wheat in Eureka County, NEVADA, during July and partially or completely destroyed heads on large acreages.

SAY STINK BUG (Chlorochroa sayi) infestations and damage were heavy on wheat in Eureka County, NEVADA, during July and partially or completely destroyed heads on large acreages. Say stink bug and GREEN STINK BUG (Acrosternum hilare) infested wheat in COLORADO during the year.

RICE STINK BUG (Oebalus pugnax) continued light in rice in ARKANSAS as widespread use of herbicides for grass control greatly reduced stink bug infestations.

MEADOW SPITTLEBUG (Philaenus spumarius) nymphs were unusually heavy on small grains during May in Douglas County, OREGON.

HESSIAN FLY (Mayetiola destructor) was active statewide in OHIO during 1966, with some fields being 35 percent infested. Field populations infesting resistant wheats in INDIANA were slightly lower in 1966 than in 1965. Of 317 certified fields sampled, 69 percent were infested in 1966 compared with an 84-percent infestation during 1965. Heaviest average infestations for W38 resistant wheat occurred in Knox County where 26.7 percent of the Monon, 41.7 percent of the Reed, and 24.0 percent of the Riley was infested. The annual survey of wheat stubble during July in ILLINOIS showed a remarkable increase in Hessian fly populations. The State average was 14.35 puparia per 100 tillers and 9.86 percent of the tillers infested. In 1965, the corresponding figures were 1.5 and 1.28. However, a follow-up survey November 8-10 in fall-sown wheat in the east-southeast district of Illinois did not reveal any infested fields. Hessian fly infestations were light throughout MISSOURI. Populations entering winter hibernation in the fall of 1965 were widespread but light in KANSAS. A general westward and southwestward spread was the result of the change from resistant to susceptible wheat varieties. Greater losses can be expected in this area of Kansas. Many severe infestations found in early planted fields this fall reduced fall pasture. This will contribute considerably to winter kill in many fields. Hessian fly damaged grain in 18 MONTANA counties in 1964, but activity diminished greatly in 1965 and still more in 1966. Trials for resistant wheat varieties were initiated in Big Horn County where a 5 to 15-percent loss occurred in 1965. No data were obtained in 1966 since Hessian fly did not appear in that area of Montana.

WHEAT STEM MAGGOT (Meromyza americana) was moderate in some wheat fields in northeastern NEBRASKA during 1966 and caused white-heads to appear in wheat in NORTH DAKOTA during early July where infestations did not exceed 1 percent; however, wheat stem maggot occurred statewide in MINNESOTA, but was generally low in small grains.

A RICE LEAF MINER (Hydrellia griseola) caused some damage and required controls in rice-growing areas of CALIFORNIA. A TADPOLE SHRIMP (Triops longicaudatus) was generally light in growing rice in California during the 1966 season.

GREEN JUNE BEETLE (Cotinis nitida) larvae were very severe in barley in Franklin County, VIRGINIA, in early October. RICE WATER WEEVIL (Lissorhoptrus oryzophilus) showed resistance to recommended and commonly used insecticides in ARKANSAS.

WHEAT WIREWORM (*Agriotes mancus*) was moderately heavy and caused yellowing of a field of oats in Erie County, PENNSYLANIA. Unspecified WIREWORMS were noneconomic in most small grain fields in NORTH DAKOTA.

BLACK CUTWORM (*Agrotis ipsilon*) caused considerable damage to approximately 2,000 acres of small grains in Falls County, TEXAS, during early October. PALE WESTERN CUTWORM (*A. orthogonia*) caused light to moderate damage to wheat in southwest and west-central KANSAS in April and May. Controls were applied in a few instances. Pale western cutworm infested wheat in COLORADO. A CUTWORM (*Euxoa* sp.) required controls on spring barley in several areas of OREGON, and occurred on small grains throughout Gilliam, Sherman, and Morrow Counties in late April. VARIEGATED CUTWORM (*Peridroma saucia*) damage was very light in INDIANA during 1966 and adult trap catches were well below those of 1965.

GRASS THRIPS (*Anaphothrips obscurus*) infested barley in Daniels County, MONTANA. BARLEY THRIPS (*Limothrips denticornis*) occurred in economic numbers throughout NORTH DAKOTA. Migrations into barley began in mid-June and thrips were found in leaf sheaths 2 weeks later. Infestations occurred in wheat and stem breakage ranged up to 15 percent. A LEAFHOPPER (*Dikraneura carneola*) severely damaged 100 acres of wheat in Whitman County, WASHINGTON.

BROWN WHEAT MITE (*Petrobia latens*) populations reached usual damaging proportions on small grains in the High Plains of TEXAS during late winter and early spring. Populations damaged wheat in scattered areas of northwest OKLAHOMA during late March and April. Counts ranged 300-500 per linear foot in several areas and up to 2,000 per linear foot in Major County. Fall activity in Oklahoma began in late November, but continued light. Brown wheat mite increased to high levels of 1,000-2,000 per linear foot of row in some areas of western KANSAS during the spring, with controls applied in a few instances. Rains in mid-April caused populations to decline sharply and remain noneconomic the remainder of the season. Infestations were noted on wheat in COLORADO. Adults and nymphs were first noticed on winter wheat May 18 in Platte and Goshen Counties, WYOMING. Counts averaged 15 and 45 per linear foot of row respectively. Brown wheat mite infested small grain in Liberty and Pondera Counties, MONTANA, and in other widely separate areas of that State, and was abundant on wheat in Douglas County, WASHINGTON, in June. Brown wheat mite infested grain fields in Siskiyou County, CALIFORNIA.

WINTER GRAIN MITE (*Penthaleus major*) reached its usual damaging proportions on small grains in north-central TEXAS during late winter and early spring. Infestations were light in OKLAHOMA during January but increased in February, becoming moderate to heavy in several areas of the State during March and April. Some damage occurred to small grains in April. Fall activity began in early November and heavy numbers were present in scattered fields in the north-central area by mid-December. Winter grain mite was heavier than normal on wheat in southeast KANSAS in the fall of 1966, with some bronzing of leaves evident.

WHEAT CURL MITE (*Aceria tulipae*) infestations were very low in wheat in KANSAS. Few infestations became established in the fall of 1965 except for a small area in the southwest section. These infestations did not spread during the winter and severe spring drought masked mosaic symptoms so completely that no estimate of loss could be made.

WHEAT STEM SAWFLY (*Cephus cinctus*) surveys revealed infestations in 20 western counties of NORTH DAKOTA, with 12.5-100 percent of fields infested. The area average was 66.72 percent of fields infested. Cut stems ranged 0-12 percent, averaged 2.82 percent. Infestations were highest (13.09 percent infested stems) in northwestern counties and lowest (2.37 percent infested stems) in west-central counties of North Dakota. Wheat stem sawfly infestations were less severe in OHIO than in 1965.

TURF, PASTURES, RANGELAND

Highlights:

FALL ARMYWORM was usually severe on Bermuda grass in Florida and damaged pastures and lawns in Alabama and Texas. A SOD WEBWORM was particularly heavy in large areas of southern Florida. BILLBUGS and WHITE GRUBS were damaging in several areas. GRASS BUGS caused extensive damage to rangeland grasses in Utah. BERMUDAGRASS MITE continued to damage Bermuda grass in Oklahoma and was found in several new counties in that State.

FALL ARMYWORM (Spodoptera frugiperda) was unusually severe, particularly on Bermuda grass in FLORIDA, and probably other lawn grasses as well. Some damage occurred on centipedegrass, which is unusual. Infestations were light and sporadic on pastures during the year in central and southern ALABAMA. Fall armyworm damaged pasture grasses and lawns, as well as small grains, in several areas of TEXAS during early fall. Populations were lighter than in previous years, however.

GLASSY CUTWORM (Crymodes devastator) damaged lawns in Pershing County, NEVADA, in June and July. A GRASSWORM (Mocis latipes) was common throughout FLORIDA and heavy on several young St. Augustine grass pastures at Belle Glade. LESSER CORNSTALK BORER (Elasmopalpus lignosellus) was the principal pest that destroyed several hundred acres of young winter rye pastures in Sumter and Marion Counties, FLORIDA, during late October.

SOD WEBWORMS (Crambus spp.) were the most serious pests of turf in RHODE ISLAND during 1966. Populations were very heavy and damage severe to turf. These pests were moderate to heavy throughout NEW JERSEY. Crambus spp. infestions increased in FLORIDA, but generally remained unimportant. Unspecified webworms damaged all lawn grasses in Florida during 1966. The unusually severe infestations of the past summer damaged centipedegrass, which is unusual. Pachyzancla phaeopteralis was heavy in large areas in the southern half of Florida during the summer. This was one of the worst 2 or 3 years in the past 15. Increases were probably due to the fact that parasitism by ichneumon wasps was adversely affected by almost continually wet turf.

WESTERN TUSSOCK MOTH (Hemerocampa vetusta) was heavy on bitterbrush in areas of Ormsby and southern Washoe Counties, NEVADA, in June. SAGEBRUSH DEFOLIATOR (Aroga websteri) varied light to heavy in northern counties but was most noticeable in Lander County during June.

PAINTED LADY (Vanessa cardui) adults migrated in all areas of WYOMING in mid-May. By June 10, larval damage was occasionally extensive on Canada thistle (Cirsium arvense). This was the second consecutive year larvae were numerous on this host in the State.

BILLBUGS (Sphenophorus spp.) damaged lawns in Pershing County, NEVADA, during June and July. Unspecified billbugs were more abundant and/or damaging to lawns in UTAH than normal. Sphenophorus phoeniciensis heavily damaged many lawns in Yuma and Maricopa Counties, ARIZONA, as well as annoyed homeowners in populated areas of these counties. BLUEGRASS BILLBUG (S. parvulus) damaged zoysia lawns in Johnson County, KANSAS, during August, and S. venatus vestitus damaged zoysia turf in the Kansas City and Wichita areas of that State. In NEBRASKA, bluegrass billbug damaged bluegrass in Lincoln, Lancaster County, a new county record. Adults and larvae of unspecified billbugs caused serious damage to zoysia turf in Montgomery and Prince Georges Counties, MARYLAND, during the summer of 1966. Billbugs were not an economic problem in FLORIDA where chemical controls were used, but were occasionally severe on zoysia and and Bermuda grass.

A FLEA BEETLE (Chaetocnema magnipunctata) caused damage to and killed dichondra lawns in southern CALIFORNIA.

WHITE GRUBS (Phyllophaga spp.) caused severe damage to lawns, pastures and other hosts in scattered locations over MINNESOTA, with some lawns and pastures being destroyed. Adult flights peaked June 10 in WISCONSIN, and reports of severe larval damage to lawns and gardens were common throughout the summer. Larvae were a severe problem where corn and potatoes were planted in fields which had been in sod previously. In NEBRASKA, larvae of Phyllophaga anxia averaged 1.7 per square foot in grassland in some parts of Cherry County with some light damage noted in localized areas. Light infestations of unspecified WHITE GRUBS caused light damage to lawns in Hancock County, MAINE. However, skunks digging for grubs caused intensive injury and in some instances very heavy damage in mid-June.

NORTHERN MASKED CHAFER (Cyclocephala borealis) adults were unusually heavy at lights in Prince Georges County, MARYLAND, during late June and early July.

CHINCH BUG (Blissus leucopterus) infested lawns in South Kingstown, RHODE ISLAND, in July and August. Chinch bug damaged home lawns in central and northern NEW JERSEY counties, where populations peaked during August and September. Populations in western and southeastern PENNSYLVANIA caused severe damage to many lawns. Infestations in FLORIDA were generally much smaller early in the year than in recent years, but by late summer, there was some general increase. Low numbers were probably due to unusually unfavorable wet conditions and widespread use of insecticial treatments. In recent years, chinch bug has damaged only St. Augustine grass in Florida.

A SPITTLEBUG (Prosapia bicincta) infested Bermuda grass during the spring in central and southern ALABAMA, but was lighter than in 1965. This spittlebug was a severe summer problem in pastures in FLORIDA on Pangolagrass in Manatee County, on St. Augustine grass primarily, Bermuda grass and Pangolagrass in the Belle Glade area of Palm Beach County. Populations at Belle Glade had 2 main peaks. Adults averaged over 5,000 per blacklight trap per night in June and over 4,500 per trap night in late August and early September.

MEADOW SPITTLEBUG (Philaenus spumarius) nymphs were unusually heavy on grass during May in Douglas County, OREGON.

GRASS BUGS were very destructive to range grasses in UTAH during 1966. Approximately 200,000 acres of planted range grasses and 3,000 acres of wheat and other small grains were severely damaged. Wheat was damaged in Millard, Juab, Iron, Box Elder, and Sevier Counties and less extensively in other counties. Damage by Labops hesperius was particularly severe to several thousand acres of crested and intermediate wheatgrass plantings. L. hesperius, Irbisia brachycerus and I. pacificus caused extensive damage during each of the past 5 seasons, especially to crested wheatgrass. L. utahensis and I. shulli were also among the more damaging of the grass bugs in Utah. I. shulli damaged ryegrass from Monte Cristo to Huntsville and severely discolored intermediate wheatgrass in the Peterson area of Morgan County at an elevation of 7,000 feet. Stenodema pilosipes damaged grasses north of Fountain Green and Trigonotylus dohertyi infested planted grasses in the Alton area, both in early June.

GRASS THRIPS (Anaphothrips obscurus) damaged timothy pastures in Lyon and Douglas Counties, NEVADA, during May. Other THRIPS (Chirothrips spp.) caused moderate damage to Bermuda grass in the Wellton and Roll areas of Yuma County, ARIZONA, where controls were necessary to prevent extensive damage. Also in Arizona, a WHITEFLY (Aleurocybotus occiduus) damaged Bermuda grass seed and necessitated controls in seed-producing areas of Yuma County.

A CRICKET (Nemobius fasciatus) continued as a major pest of crimson, white and other clovers in pastures and sod during the fall in ALABAMA, especially in central and western sections.

RHODES-GRASS SCALE (Antonina graminis) ranged medium to heavy and damaged lawns in Graham, Maricopa, Pinal and Yuma Counties, ARIZONA. This scale is of particular importance to turf grasses of golf courses.

BROMEGRASS SEED MIDGE (Stenodiplosis bromicola) averaged 56 per 100 sweeps on bromegrass during late May in Saunders County, NEBRASKA. Diapausing larvae were found in bromegrass fields in Lancaster, Gage and Cass Counties in mid-July. Populations appear to be widespread in the State. EUROPEAN CRANE FLY (Tipula paludosa), a serious pest of grass, was collected at Blaine, WASHINGTON, during 1966 for a new United States record.

BERMUDAGRASS MITE (Aceria neocynodonis) was serious on some local plantings of Bermuda grass in FLORIDA, but is not a major pest statewide. There was no indication of increased infestations over previous years. Bermudagrass mite continued to damage Bermuda grass lawns in OKLAHOMA, with several new counties found infested during the summer and fall. This mite severely damaged Bermuda grass lawns in Yuma, Maricopa, Pinal and Pima Counties, ARIZONA. BANKS GRASS MITE (Oligonychus pratensis) was heavy on timothy pastures in Lyon County, NEVADA, in late April and May.

Although the number of infestations of a SPIDER MITE (Oligonychus stickneyi) on St. Augustine grass in FLORIDA is low, more damage is being noted along the southeast coastal area from Palm Beach southward.

weather continued from page 130

TEMPERATURE: While mild weather continued from the Rockies to the Sierra ranges, bitter cold prevailed over the eastern half of the Nation. During the latter half of the week, a large and stagnant mass of Arctic air extended from the eastern slopes of the Rockies to the Atlantic coast. Subzero temperatures occurred in more than 20 States with temperatures of 30° below zero in New England. Some Colorado mountain valleys experienced -35° and mountain locations in western North Carolina registered -20° and colder. Several subzero mornings occurred in the northern Great Plains. Temperatures dropped to 32° along the gulf and south Atlantic coasts and freezing hit much of Florida. Moderation came to the central Plains as southerly winds sent temperatures into the 50's and 60's; Bismarck, North Dakota, emerged from the "deep freeze" with a high of 37°. Temperatures over the Ohio River Valley averaged 15° to 18° colder than normal. (Summary supplied by Environmental Data Service, ESSA).

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